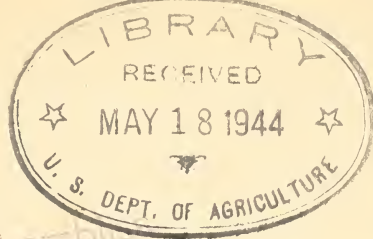


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Issued January 26, 1910.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY—Circular No. 47.

B. T. GALLOWAY, Chief of Bureau.

PRICKLY COMFREY AS A FORAGE CROP.

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WASHINGTON : GOVERNMENT PRINTING OFFICE : 1910

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[Cir. 47]

PRICKLY COMFREY AS A FORAGE CROP.^a

INTRODUCTION.

Prickly comfrey (*Symphytum aspernum* Donn) is a perennial herbaceous plant, a native of the Caucasus region of Europe, which was introduced into England as early as 1801. Apparently it was first grown in the United States near Richmond, Va., in 1876. The only recorded importation of this plant by the Department of Agriculture was made in February, 1899, from France. In 1830 it attracted attention in England as a forage plant, and from that date until 1876 or later some little interest was exhibited in its dissemination by agriculturists. Thomas Christy, jr., of London, was especially prominent in its advertisement and published a lengthy article^b descriptive of its value as a food for hogs, sheep, and dairy cows, especially as a soiling crop and in the form of ensilage.

Although prickly comfrey was grown rather extensively years ago in Europe and to some extent in the United States, it has never attained any considerable importance in either country as a forage crop. At the present time it is probably grown more generally in Germany than in any other country, and its success there may be ascribed to the intensive methods of cultivation employed on small farms, a practice which calls for some crop that will respond with large yields to heavy applications of fertilizer. Only under such methods can the yields of forage mentioned in reports from Germany be expected. None of the government experiment stations in European countries have seen fit to commend prickly comfrey in their reports so far as noted.

^a Prickly comfrey has been grown as a forage crop to some extent in Europe, and in scattered instances with success in this country. Its general standing, however, has not seemed to warrant an extended trial by the Department of Agriculture. Recently advertisements making exaggerated claims regarding its value as a forage crop have appeared in newspapers and circulars. It is therefore deemed advisable to publish in a concise form the results of tests of this crop at several state experiment stations, together with a brief description of the plant and directions for its culture. This will enable intending growers to draw their own conclusions as to its probable value for their purposes.—B. T. GALLOWAY, *Chief of Bureau*.

^b Christy, Thomas, jr. Forage Plants and Their Economic Conservation by the New System of "Ensilage," Part I. London, 1877.

DESCRIPTION OF PRICKLY COMFREY.

The seed stalks of prickly comfrey reach a height of 2 to 4 feet and are surrounded by numerous long, heavy, rough leaves of a dark-green color somewhat mucilaginous in texture. (See fig. 1.) The bright-blue flowers are borne in nodding, one-sided clusters (fig. 2, *A*). The roots are large and fleshy and in loose soil will reach a depth of



FIG. 1.—A plant of prickly comfrey in bloom.

8 or 9 feet. The plant is hardy and will endure considerable cold or drought, making a very rapid growth when conditions are favorable.

PROPAGATION OF THE PLANTS.

Although the prickly comfrey produces large crops of seed, only a small percentage of this seed will germinate, so it is generally found more practicable to plant new fields by division of the roots than by

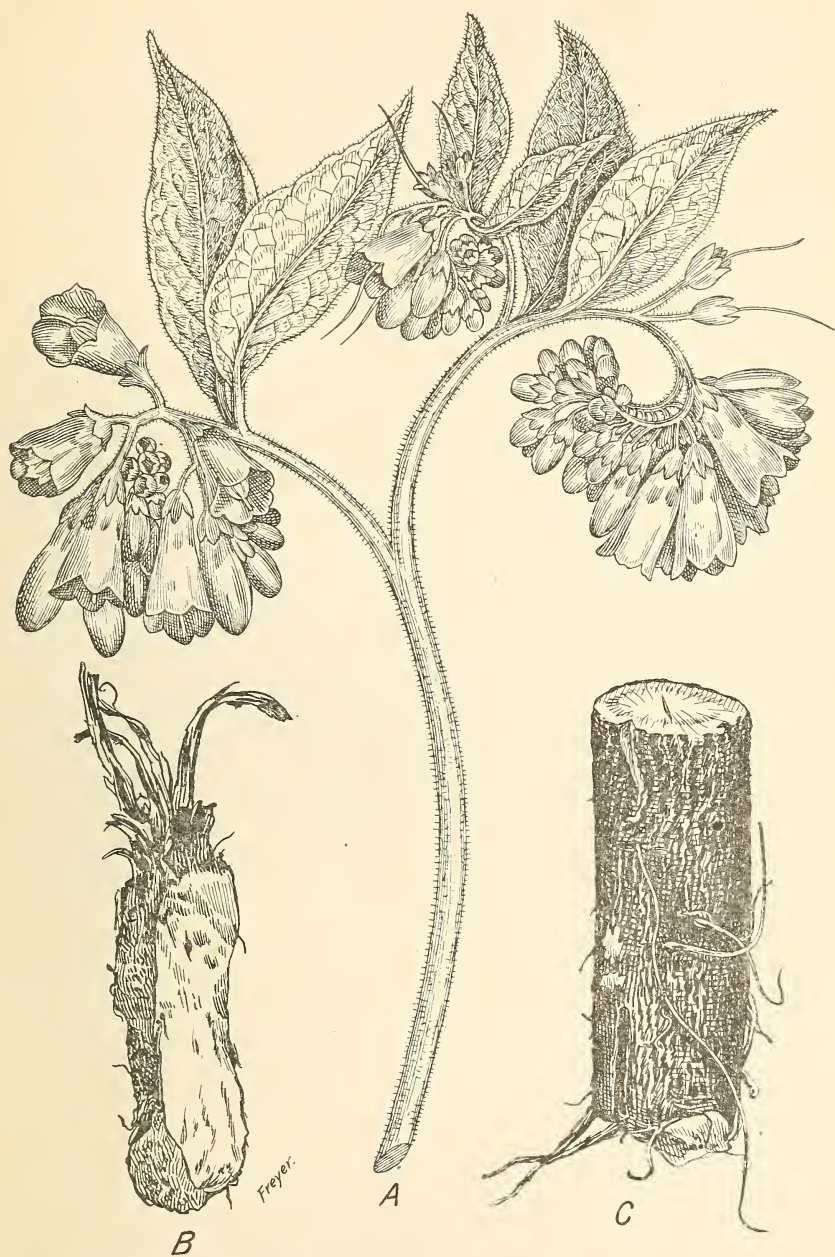


FIG. 2.—A, a flowering stem of prickly comfrey; B, a crown cutting; C, a taproot cutting.

seed. These root cuttings may be either crown cuttings (fig. 2, *B*) or transverse sections of the lower taproots (fig. 2, *C*), and they may be quite small, so that the number secured from a single plant will be considerable even in one year. They are planted in rows, usually about 3 feet apart each way, or 3 feet between the rows and $1\frac{1}{2}$ to 2 feet apart in the row, the distance depending on the fertility of the soil. When first planted, the young sets must be given frequent and thorough cultivation. The sets made from crown cuttings usually bloom the first year, while those made from pieces of the taproots will not bloom as a rule until the second season.

CULTURE OF THE CROP.

Cultivation should be continued after each cutting until the plants are large enough to shade the ground, and a light top-dressing of manure should be given the field after each cutting if large and frequent crops are to be expected. The cuttings should always be made before seed has formed. From three to six crops a year may be obtained, and in good soil a field is supposed to last from fifteen to twenty years without replanting, returning a yield of 10 to 40 tons of green feed per acre each year.

VALUE OF PRICKLY COMFREY AS A SOILING CROP FOR DAIRY COWS.

It is as a soiling crop for dairy cows that comfrey has proved of most value. Dr. Henry Foster, of Clifton Springs, N. Y., has been in the past the most enthusiastic advocate of comfrey for this purpose.^a Doctor Foster top-dressed his fields with manure after each cutting and cultivated thoroughly. In this way he claimed to have secured a yield of 50 tons per acre in five cuttings. According to his statement the cows ate it greedily, and no other crop equaled it in producing quantity and quality of milk.

At the New York Agricultural Experiment Station^a dairy cows at first refused to eat green comfrey. Corn meal was then sprinkled over the comfrey in the manger, but it was knocked off and licked up from the bottom of the feed boxes. As a last resource, salt was scattered over the comfrey and the animals were thus induced to eat it. They soon became fond of it and afterwards ate it readily without salting.

VALUE OF PRICKLY COMFREY FOR FEEDING HOGS.

Experiments were carried on at the New York Agricultural Experiment Station^b in which two lots of hogs, averaging 64 pounds each, were fed during three weeks all the comfrey they would eat, in addi-

^a Report, New York Agricultural Experiment Station, 1887, p. 72.

^b Bulletin 22. n. s., New York Agricultural Experiment Station, pp. 292-295.

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tion to "a little corn meal." The average loss in weight of one lot was 0.9 pound per week, and of the other lot 1.6 pounds. This loss was not due to lack of capacity, since in a similar experiment with mangolds, which contained as great a percentage of water as the comfrey, the hogs ate twice as much.

Another test with older pigs was made, using for the first six weeks a ration composed entirely of grain; the next four weeks a ration that was 50 per cent corn ensilage; and the remaining five weeks of the period a ration containing 50 per cent of comfrey. The comfrey was fed freshly cut and contained an average of 86.7 per cent of water. In considering the cost per pound of gain, the green comfrey was rated at \$1 a ton. In one pen the comfrey and ensilage were salted, while in another pen the green feed was not salted. Neither lot of pigs made a profitable growth while comfrey was fed, and the cost per pound of gain in live weight for the period they were fed comfrey was 9.53 cents in the pen where salt was not applied and 6.12 cents in the pen where salt was applied, as against 3.38 cents in the first pen and 3.07 cents in the second pen when fed the grain ration.

VALUE OF PRICKLY COMFREY AS HAY OR ENSILAGE.

Regarding the use of prickly comfrey, the New York Agricultural Experiment Station reports^a as follows: "Our trials indicate that it is of no value either for hay or ensilage. Its use, therefore, is confined to that of a soiling crop." In Europe it has been used to some extent for silage, but the watery and gummy nature of the leaves is apt to cause it to heat in the silo and acquire a disagreeable odor.

CROP YIELDS.

From 14 to 16 tons of green matter per acre are reported by the New York Agricultural Experiment Station,^a 46 tons by the Vermont station,^b 6½ to 17½ tons by the North Carolina station,^c and 33½ tons by the Wisconsin station.^d

In dry matter the Wisconsin Agricultural Experiment Station reports^d a yield of 6,475 pounds of comfrey to the acre, compared to 7,987 pounds of red clover.

The Pennsylvania Agricultural Experiment Station reports^e the yield per acre of digestible material in comfrey, Kafir corn, and cowpeas to be as follows:

^a Report, New York Agricultural Experiment Station, 1888, pp. 332 and 333; 1889, pp. 221 and 222.

^b Report, Vermont Agricultural Experiment Station, 1889, p. 87.

^c Bulletin 168, North Carolina Agricultural Experiment Station, pp. 429-432.

^d Report, Wisconsin Agricultural Experiment Station, 1889, pp. 207 and 211.

^e Bulletin 6, Pennsylvania Agricultural Experiment Station, pp. 14-16.

	Prickly comfrey.	Kafir corn.	Cowpeas.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Fat.....	30.5	34.2	53.9
Crude fiber.....	35.3	33.2	247.0
Nitrogen-free extract.....	623.1	907.8	690.0
Protein.....	221.0	119.4	280.9
Total digestible matter.....	909.9	1,094.6	1,271.8
Total green matter.....	16,500.0	11,000.0	14,500.0

These figures indicate that although the yield of green matter is greater in prickly comfrey, the real food value is likely to be less than that of the commonly grown forage crops.

COMPARISON OF PRICKLY COMFREY AND RED CLOVER.

At the Wisconsin Agricultural Experiment Station ^a equal areas of red clover and comfrey were planted in 1887. The comfrey was top-dressed heavily with stable manure. Yields of both were determined the second year, the cuttings being made with a scythe. The red clover returned 26 tons of green feed to the acre in three cuttings, and the comfrey 33½ tons. Samples were taken of the cuttings of both crops and the dry matter determined. The red clover produced 23 per cent more of total dry matter and 25 per cent more protein in three cuttings than the comfrey did in four. A more important difference between the two crops is in the lesser cost of planting and harvesting the red clover and its greater palatability to stock. It would seem that prickly comfrey can not compete with red clover as a forage crop for the general farmer.

COMPARISON OF PRICKLY COMFREY AND ENSILAGE CORN.

In Michigan ^b comfrey was grown side by side with ensilage corn, and the trials taught emphatically that in the soil and climate existing at the Michigan station corn is far superior as a forage crop to comfrey."

COMPARISON OF PRICKLY COMFREY AND ALFALFA.

The older planting of comfrey at the New York Agricultural Experiment Station during 1889 gave a yield of 14 tons of green matter per acre. Alfalfa during the same period yielded more than 16 tons of green matter per acre.

DISEASES OF PRICKLY COMFREY AND INSECT ENEMIES.

Comfrey has been grown at the North Carolina Agricultural Experiment Station since 1899.^c It grew well but was injured by both caterpillars and a fungous disease, which reduced the crop to two or three

^a Report, Wisconsin Agricultural Experiment Station, 1889, pp. 207 and 211.

^b Bulletin 47, Michigan Agricultural Experiment Station, pp. 43 and 44.

^c Bulletin 73, North Carolina Agricultural Experiment Station, p. 59.

cuttings each year, while many hills were killed out entirely by the disease. When planted on a thin soil with a hard clay subsoil, the third growth withered up during the period of drought and the plants remained dormant until the following spring.

EFFECT OF PRICKLY COMFREY ON THE SOIL.

The soil in an old comfrey field is usually left in good condition, owing to frequent cultivations and to the top-dressings of barnyard manure. The large, fleshy roots of the comfrey also penetrate to a considerable depth and add humus to the subsoil, where it is usually wanting. Analyses of the materials removed from the soil,^a however, show that were it not for the constant application of fertilizing material the growing of comfrey would be decidedly injurious to the soil. Assuming 20 tons of green material to the acre as an average crop of comfrey, there would be removed from the soil 165 pounds of nitrogen, 65 pounds of phosphoric acid, and 74 pounds of potash.

From the present knowledge of prickly comfrey, it is advisable to experiment with it only on a small scale as a soiling crop. There seems little to justify its extended use in a region where alfalfa or red clover will succeed. Large yields have not been obtained without heavy applications of fertilizer, and a comparison of prickly comfrey with the forage crops already in use has usually resulted unfavorably to the comfrey.

Approved:

JAMES WILSON,

Secretary of Agriculture.

WASHINGTON, D. C., *December 10, 1909.*

^a Report, Canada Experimental Farms, 1896, p. 201.

